INTELLIGENCE

SOME CLASSIC DEFINITIONS

Spearman (1904)

- A general ability which involves mainly the eduction of relations and correlates

Binet & Simon (1905)

- The ability to judge well, to understand well, to reason well

Terman (1916)

- The capacity to form concepts and grasp their significance

Thurstone (1921)

- The capacity to inhibit instinctive adjustments, flexibly imagine different responses, and realize modified instinctive adjustments into overt behaviour

Wechsler (1939)

- the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with the environment

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Sternberg (1985)

- the mental capacity to automatize information processing and to emit contextually appropriate behaviour in response to novelty; intelligence also includes metacomponents, performance components, and knowledge-acquisition components

Gardner (1986)

- the ability or skill to solve problems or to fashion pro ducts which are valued within one or more cultural settings

Intelligence

The ability to learn from experience, solve problems, and use knowledge to adapt to new situations. Is socially constructed thus can be culturally specific.

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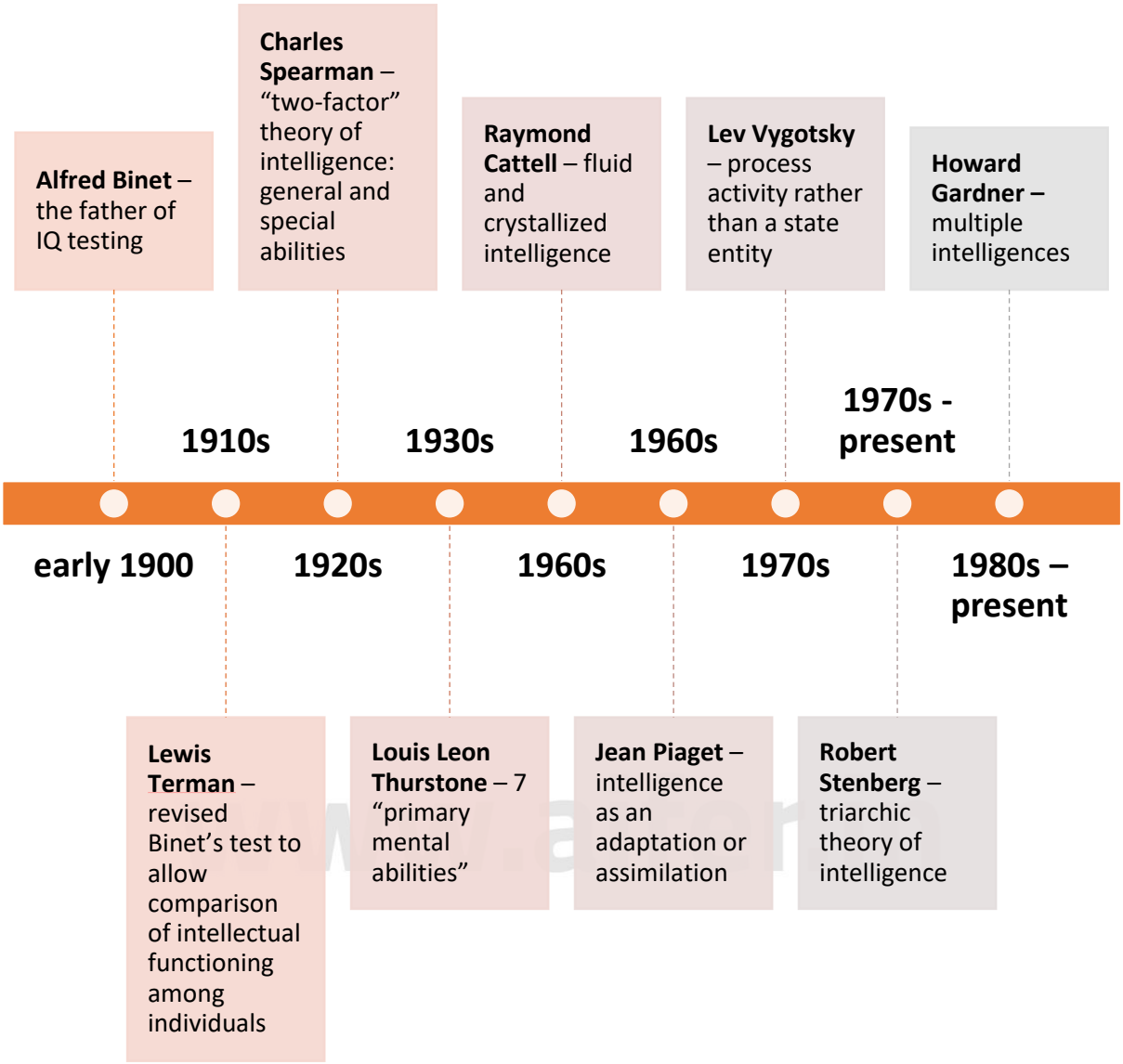
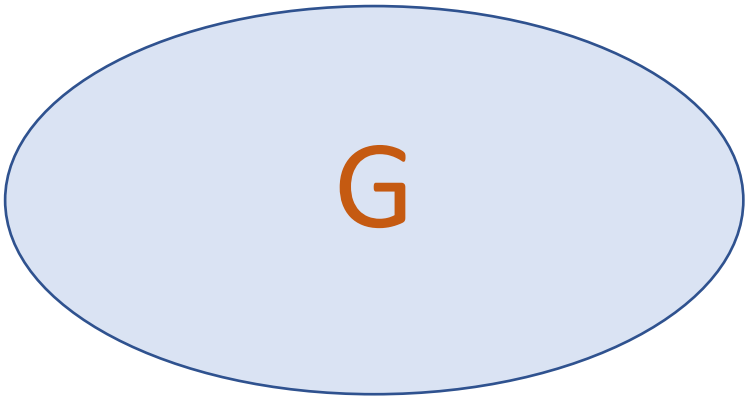

Alfred Binet – the father of IQ testing
Charles Spearman – "two-factor" theory of intelligence: general and special abilities
Raymond Cattell – fluid and crystallized intelligence
Lev Vygotsky – process activity rather than a state entity
Howard Gardner – multiple intelligences
1910s
1930s
1960s
1970s - present
early 1900
1920s
1960s
1970s
1980s – present
Lewis Terman – revised Binet's test to allow comparison of intellectual functioning among individuals
Louis Leon Thurstone – 7 "primary mental abilities"
Jean Piaget – intelligence as an adaptation or assimilation
Robert Stenberg – triarchic theory of intelligence

❖ **Uni- Factor Theory of Intelligence**

- ✓ Uni factor theory of intelligence which has also been known as the general capacity theory.
- ✓ Main proponents; Wilhelm Stern and Alfred Binet.
- ✓ considered that all persons are endowed with G, though in unequal amounts. It is applied to any problem solving situation, the efficiency of which depends solely upon the environment. Thus, uni factor theory is the simplest one.



❖ **Two Factor Theory- Spearman**

- ✓ In terms of the two-factor theory, we may regard that tests a and b are two measures of the common element "g", with the two remainders sa and sb. Similarly, let p and q be two other tests with "g" as the common element as shown in the Figure above.
- ✓ For some experiments, Spearman (1904) reported the correlations between "g" and "g" to approximate a value of 1.00. This meant that "g" and "g" were practically identical.
- ✓ Spearman believed that all intellectual activity contained some element or factor in common. This "g",or general factor, was postulated to be important in every mental act, although some acts were thought to depend upon it more than others.
- ✓ The difference between people in intelligence was a matter of how much "g"they possessed. Spearman called this general factor as **"mental energy."**

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To find out scientists use **FACTOR ANALYSIS:** A statistical procedure that identifies clusters of related items on a test. Charles **Spearman** used FA to discover his **g** or **(general intelligence).**

Charles Spearman, who proposed that intellectual abilites were comprised of two factors : one general ability or common ability known as 'G' factor and the other a group of specific abilities known as 'S' factor.

'G' factor is universal inborn ability. Greater 'G' in an individual leads to greater success in life. 'S' factor is acquired from the environment. It varies from activity to activity in the same individual.

❖ **Thurstone & Primary Mental Abilities**

Using his new approach to factor analysis, Thurstone found that intelligent behavior does not arise from a general factor, but rather emerges from seven independent factors that he

called *primary abilities*: word fluency, verbal comprehension, spatial visualization, number facility, associative memory, reasoning, and perceptual speed (Thurstone, 1938).

Furthermore, when Thurstone analyzed mental test data from samples comprised of people with similar overall IQ scores, he found that they had different profiles of primary mental abilities, further supporting his model and suggesting that his work had more clinical utility than Spearman's theory.

However, when Thurstone administered his tests to an intellectually heterogeneous group of children, he failed to find that the seven primary abilities were entirely separate; rather he found evidence of *g*.

Thurstone managed an elegant mathematical solution that resolved these apparently contradictory results, and the final version of his theory was a compromise that accounted for the presence of both a general factor and the seven specific abilities.

This compromise helped lay the groundwork for future researchers who proposed hierarchical theories and theories of multiple intelligences.

Certain' mental operations have in common a 'primary' factor that gives them psychological and functional unity and that differentiates them from other mental operations. These mental operations then constitute a group.

A second group of mental operation has its own unifying primary factor, and so on. In other words, there are a number of groups of mental abilities, each of which has its own primary factor, giving the group a functional unity and cohesiveness. **Each of these primary factors is said to be relatively independent of the others**.

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when he applied factor analysis to items making up intelligence tests, discovered several broad group factors.

- ✓ the seven which have been frequently corroborated are referred to as the primary mental abilities:
    - verbal comprehension
    - word fluency
    - number
    - space
    - associative memory
    - perceptual speed
    - inductive reasoning

Verbal Comprehension: the ability to understand the meaning of words; vocabulary tests represents this factor.

Word fluency: the ability to think of words rapidly, as in solving anagrams or thinking of words that rhyme

Number: the ability to work with numbers and perform computations

Space: the ability to visualize space-from relationships, as in recognizing the same figure presented in different orientations

Memory: The ability to recall stimuli such as word pairs or sentences

Perceptual Speed: the ability to grasp information quickly and to see similarities and differences between stimulus.

Reasoning: the ability to find a general rule on the basis of presented instances, as in determining how a number series is constructed after being presented with only a portion of that series.

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